

Is the energy of the valence electrons of an atomic or a molecular bond available as real power when it is broken versus reactive power when it is borrowed as during its use within a live circuit?

I think there are some wrong ideas built into this question. Energy is not released when a bond is broken. Energy is released when the bond is formed! After that, breaking bonds must be allowed to absorb energy, or the breaking will not happen.

In the context of making or breaking bonds, I only know of "real power". The phrase "reactive power" does not seem to apply.

And how is a "live circuit" related to all this? It can be related by an electrochemical battery setup, but no battery has been specified here.

I merely used real power as a comparison for setting up this question. It was never intended to be the subject of the question.

The subject of the question is reactive power and its relation to chemical bonds.

Since reactive power is never spent — it is merely lent on a borrowing basis, on a loan basis, and paid back (unless some of it converts into real power and is lost through heat or some other inefficiency), likewise — I was considering the possibility that chemical bonds (their energy, one way or another, lost or gained when they're formed or broken; the storage of either: a debt of energy or a storehouse of energy, either way): how is that parlayed into a loan situation that can be borrowed and re-borrowed just as reactive power can be loaned and reloaned on a continuing basis?

How? With specific technologies we have found that do it. None come to my mind, and you haven't specified any either, so the answer comes to nil so far.

<https://ijcionline.com/abstract/12223ijci24>

<https://en.wikipedia.org/wiki/Capacitor>

Capacitors are made to store electrical energy by bringing opposite charges to parallel conducting plates. A charged capacitor can release a lot of energy very fast when a circuit is made between the plates.

https://en.wikipedia.org/wiki/Atomic_hydrogen_welding

An electric arc can disrupt the molecular bonds in diatomic hydrogen to make atomic hydrogen

which is like charging a capacitor. The flame of a torch is partly conductive plasma so a discharging capacitor can supply energy to a flame. The atomic hydrogen has absorbed part of that energy when the molecular bonds were broken. The recombination of atoms to make molecules can release a lot of energy very fast. That is how the torch gets extremely hot.